Abstract

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Automatic PV Grid Fault Detection System with IoT and LabVIEW as Data Logger

Fault detection of the photovoltaic (PV) grid is necessary to detect serious output power reduction to avoid PV modules' damage. To identify the fault of the PV arrays, there is a necessity to implement an automatic system. In this IoT and LabVIEW-based automatic fault detection of 3×3 solar array, a PV system is proposed to control and monitor Internet connectivity remotely. Hardware component to automatically reconfigure the solar PV array from the series-parallel (SP) to the complete cross-linked array underneath partial shading conditions (PSC) is centered on the Atmega328 system to achieve maximum power. In the LabVIEW environment, an automated monitoring system is developed. The automatic monitoring system assesses the voltage losses present in the DC side of the PV generator and generates a decimal weighted value depending on the defective solar panels and transmits this value to the remote station through anRFmodem, and provides an indicator of the faulty solar panel over the built-in Interface LabVIEW. The managing of this GUI indicator helps the monitoring system to generate a panel alert for damaged panels in the PV system. Node MCU in the receiver section enables transmission of the fault status of PV arrays via Internet connectivity. The IoT-based Blynk app is employed for visualizing the fault status of the 3×3 PV array. The dashboard of Blynk visualizes every array with the status.